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REMARKS

This communication is considered fully responsive to the Final Office Action mailed July 12, 2005. Claims 2, 4, 6, 8-17, 19-22, 24, 25, 27, and 31-46 were examined and stand rejected. No claims are hereby amended. No claims are cancelled. Reexamination and reconsideration are requested.

Response to Amendment and Arguments

Applicant hereby acknowledges that in response to Applicant's previous Amendment and Arguments filed April 5, 2005, the Office has maintained the rejections to the claims, particularly the 102 rejection of claim 31, and now also of claim 34, in view of Fiete, and the 103 rejections of claims 2, 4, 6, 8-17, 19-22, 25, 27, 32, 33, 35-37, 39-42 and 44, and now also apparently of 45 and 46, on Fiete in view of Trifonov. Applicant further acknowledges the indication of allowability of claims 38 and 43 but for the rejection of the base claims from which these respectively depend.

The details of the objections and rejections are addressed herebelow.

Amendment Objection

The Office has objected to the amendment filed April 5, 2005, on the grounds that it allegedly introduces new matter into the disclosure. The specific objections are to the insertion of the square root sign (e.g., through the use of the "√6" and "√2") into the equations on page 8, lines 6, 12, 17 and 18.

Although Applicant has hereby amended and canceled this matter, Applicant does so noting only that these insertions are/were corrections of mere typographical errors and are ***not*** new matter. Corrections of such typographical errors do not raise issues of enablement under 35 USC §112, first paragraph, nor of operability under 35 USC §101.

To be more precise in the present case, the originally-filed application had numerous mathematical equations having numerical (as opposed to variable) coefficients which were intended to include square root signs, specifically "√6" and "√2." Applicant's

original electronic document included these square root signs which were nevertheless not printed or apparently not printable, presumably due to printer or printer driver error. In any case, as understood by skilled artisans in this art (artisans having minimal mathematic abilities), these entirely numerical coefficients are merely scaling factors which are inserted in the equations to provide normalization, i.e., the scaling factors act as normalization factors. Indeed, the mathematical equations presented here are nearly identical to those of a co-pending case by the same inventors; namely Serial number 09/897,736, filed July 2, 2001 (see citation on page 7, lines 16-26 of the present specification), which cites an original development of similar equations in the prior art paper cited in the specification and co-authored by one of the present inventors; namely, the paper entitled "Local radial-angular transformation of images"; M.I. Trifonov et al., Sov. J. Opt. Technol. 58(4), April 1991. The only difference is in the choice of the numerical coefficients. As understood by skilled mathematicians, the coefficients chosen in the 1991 article present an orthogonal representation of the LORA transform (the subject of the article and the tool used in the present invention) while the present matrix gives or was originally intended to give an orthonormal representation. Also as understood in the mathematics art, an orthogonal basis is a set of vectors that are mutually perpendicular whereas an orthonormal basis is a set of vectors that are not only mutually perpendicular but also all of length one. The difference is that the orthonormal representation is achieved by multiplying the orthogonal matrix by $1/\sqrt{6}$.

This is evident from the cited paper and corresponds to a uniform scaling of all the LORA coefficients *c*. This scaling does not affect the properties of coefficients, only their magnitudes. (This is also true when the real and imaginary parts of the coefficients are considered separately – see page 8 lines 16 and 17 of the specification). The invention primarily depends on the properties of the coefficients, not on how they are scaled. In fact, wherever a ratio of coefficients is used in the invention (see pages 8, 9 and 15) the scaling of coefficients is entirely irrelevant. However, when coefficients are compared to non-zero thresholds (see specification pages 9, 15 and 16), scaled magnitudes are important relative to each other and to the threshold; i.e., the choice of threshold depends on how the coefficients have been scaled. As such, the thresholds are variable depending upon the selection of the scaling factor(s). Thus, the equations are not incorrect as written before amendment, they are merely scaled differently from the orthonormal aim. The attempt in

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correction of typographical errors in the application was merely to achieve the orthonormal, it was not necessary for enablement, written description or operability. This is true also because an error-free description of the LORA transform containing all the information about scaling was already present in the application by virtue of it being included within the prior cited art; namely the Trifonov et al. article from 1991.

These objections have thus been fully obviated and/or traversed and can therefore be withdrawn. Action to this end is respectfully requested.

Claim Rejections – 35 USC §102

Clais 31 and 34 stands rejected under 35 USC §102(b) as being purportedly anticipated by the U.S. Patent to Fiete et al., No. 5,881,182 (hereafter referred to as "Fiete"). The Applicant respectfully traverses this rejection.

Claims 31 and 34 both include "a specified range of sharpness" for the line defects to be detected by the method thereof. Fiete does not have or suggest such. More specifically, Fiete fails to teach or suggest any sharpness and no other reference is cited to demonstrate any inherency thereof; thus, no prima facie case of anticipation is made. Note that "[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987); and see, MPEP 2131. Moreover, "[t]o establish inherency, the extrinsic evidence 'must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient.' " *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (citations omitted) and see MPEP 2112.

The supposition that "there must be a specified range of sharpness" in the method of Fiete is without any cited support, and as such cannot stand. Applicants' claims require a ***specified range*** where Fiete is silent. Inherency requires more. Assuming *arguendo*, in Fiete, the determination may be based upon one or more pixel values, this does not stretch to a teaching, inherently or otherwise of a particular "***specified*** range of sharpness." Either

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Fiete must "***specify***" or a supplementary reference of support must be used to supply the missing requirement of "***specified*** range." As this rejection fails in this requirement, Applicants therefore respectfully request withdrawal of this rejection.

Claim Rejections – 35 USC §103

Claims 2, 4, 6, 8-17, 19-22, 25, 27, 32, 33, 35-37, 39-42 and 44 (and 45 and 46??) stand rejected under 35 USC §103(a) as being purportedly rendered obvious by the combination of Fiete and the cited publication of Trifonov, et al., entitled "Local Radial-Angular Transformation of Images" (hereafter referred to as "Trifonov"). The Applicant respectfully traverses these rejections.

As a first point, the law of obviousness requires that "there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings." See e.g., MPEP 2143, *inter alia*.

Fiete and Trifonov cannot be combined under this constraint. Fiete specifically teaches linear, Cartesian analyses of pixel values via a column by column approach. The columnar process itself as well as the Cartesian mathematics derived therefrom are not only incompatible with but do not suggest nor motivate any combination with a radial angular transformation process such as that taught in/by Trifonov.

In Fiete, the analysis is built upon a Cartesian coordinate system, e.g. (x, y) (see col. 3, lines 51-54, where the digital value of i(x,y) is described). The Fiete analysis proceeds in a column by column fashion exploring the relationships of pixel values of i(x,y) to i(x+1,y), the latter representing the value of the next columnar pixel. The analysis then proceeds linearly.

This is nothing like, nor suggestive of the coordinate system of Trifonov, which is angular, radial. The distinctive angular radial process of Trifonov allows for a very different analytical approach which in an implementation can then make beneficial use of the hexagonal "hexons," *inter alia* (note, the radial angular approach can also be used in a Cartesian/rectangular orientation although the radial angular approach nevertheless remains discrete from a columnar approach such as that in Fiete). In such a method, the sampling is done of the pixel values surrounding and/or defining a particular hexon.

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Moving angularly around a particular hexagonal pixel or group of pixels for sampling and analytical comparison is very different from moving an analytical process in a linear columnar fashion. This alone demonstrates that there is no suggestion or motivation in or from either of Fiete or Trifonov for combination one with the other.

Nevertheless, the mathematical results taught in the Trifonov reference also reflect the failure of any asserted combination of Trifonov with Fiete to allegedly provide the presently claimed inventions. Trifonov does teach the use of a local radial angular transform, but does so in the evaluation and determination of the shapes of boundaries in an image. Two points should be noted in this regard; first, that the mathematical development of a coefficient indicative of the boundary condition in the Trifonov reference is different from the mathematical development in the present case. Second, the reason for such a mathematical distinction is that the boundary condition there is different than the detection of a line in the present case. Luminance differentials are determined in the Trifonov reference corresponding to the two sides of a single boundary. Differently here, the luminance differentials must indicate not only a single boundary, but, the discontinuity of the line itself as detected against and/or across one or more backgrounds, by contrast thereagainst and/or by determination of width, length, orientation and/or by sharpness of edge definition of the line. Thus, the Trifonov reference does not enable or render obvious line-like determinations beyond the limits of the boundary condition taught specifically therein.

Note, present claim 22 is especially distinctive inasmuch as it presents one of the specific manners of local radial angular transform usage wherein the results of the transform; namely, $|c_3|$, is compared against two limits, L_1 and L_2, to determine whether a line-like defect is indicated. This is indeed not taught or suggested by the mathematical development in the Trifonov reference.

Moreover, a combination of Trifonov with Fiete is incompatible inasmuch as either would become inoperative or at the very least changed in the principle of operation. Forcing a radial angular method on the teaching of Fiete would render inoperative the columnar process and/or change the principle of operation. Neither Trifonov nor Fiete demonstrate how the linear regression analyses of Fiete would remain operative in a radial angular mathematical scheme. Similarly, forcing a linear columnar approach on the Trifonov teaching would not only change the principle of operation, but is against the

teaching of Trifonov. In Trifonov, a distinction is shown of his hexagonal pixel sampling approach wherein the sampling relies upon the sampling of all adjacent hexagons, the sample size being six (6) as compared the lesser sampling size in a square sampling system where the sample size is four (4) (note, each hexagon or square includes one or a group of pixels to be sampled). Fiete, on the other hand, is only performing a column by column comparison, sample size of one (1) (pixel or group of pixels) at a time. Both Fiete and Trifonov thus teach away from such a combination.

A combination of references cannot render the combined process/apparatus inoperative, or change the principle of operation thereof, or render it less than satisfactory for its original purpose. See MPEP 2143.01. For the reasons given, such would be the case in any asserted combination of Fiete with Trifonov. Thus, the combination is improper here and the rejection based thereon must be withdrawn.

The impropriety of the combination of Trifonov and Fiete remains and indeed becomes epecially true in view of the Examiner's comment that Fiete is relied upon solely for the correction of the defect and not for its detection (Office Action, page 3, paragraph 6). Thus, Trifonov must be relied upon by itself to suggest the jump from detection of a boundary to the detection of a line. This is prima facie not suggested nor established by the Examiner's rejection and must thus be withdrawn.

Independent claim 2 is thus allowable, as are independent claims 17, 31-35 and 45, and all claims dependent therefrom. Claims 2, 4, 6, 8-17, 19-22, 25, 27, 32, 33, 35-37, 39-42 and 44-46 may then be allowed.

Moreover, dependent claim 24 has all of the elements of the respective independent claims from which they depend and Fiete and Trifonov therefore fail to render this claim obvious for the same reasons presented for claims 2, 4, 6, 8-17, 19-22, 25, 27, 32, 33, 35-37, 39-42 and 44-46 above regardless the teaching or alleged combinability of the Hirani article therewith.

Allowance of claims 2, 4, 6, 8-17, 19-22, 24, 25, 27, 31-37, 39-42 and 44-46 is therefore earnestly requested.

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Allowable Subject Matter

Applicants note with appreciation the allowable subject matter of claims 38 and 43. Applicants further note that due to the allowability, as set forth hereinabove, of independent claims 35 and 40 from which claims 38 and 43 respectively depend, these claims 38 and 43 are not herein amended. Claims 38 and 43 are respectfully requested to be held allowable.

Conclusion

Based on the amendments and remarks herein, the Applicant respectfully requests prompt issuance of a notice of allowance for claims 2, 4, 6, 8-17, 19-22, 24, 25, 27, and 31-46 in this matter.

Respectfully Submitted,

Dated: September 12, 2005 By: _____

Peter B. Scull
Reg. No. 37,932
(720) 377-0773